UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/802,285	03/16/2004	Vijayalakshmi R. Raveendran	030065	3631

23696   7590   04/15/2009
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EXAMINER
RASHID, DAVID

ART UNIT	PAPER NUMBER
2624	

NOTIFICATION DATE	DELIVERY MODE
04/15/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 January 2009*.
2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5-15,17-21,31-35,38-45 and 47-54* is/are pending in the application.
  4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☒ Claim(s) *34,35 and 38-42* is/are allowed.
6)☒ Claim(s) *1-3,5,13-15,31-33,43-45 and 47* is/are rejected.
7)☒ Claim(s) *6-12,17-21,35,38-42 and 48-54* is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
  Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
  Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  a)☐ All b)☐ Some * c)☐ None of:
    1.☐ Certified copies of the priority documents have been received.
    2.☐ Certified copies of the priority documents have been received in Application No. _____.
    3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
  * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)
1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
  Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
  Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Table of Contents

Amendments & Claim Status

[1]   This office action is responsive to Amendment received on Jan. 28, 2009. Claims 1-3, 5-15, 17-21, 31-35, 38-45, and 47-54 remain pending; claims 4, 16, 36-37, and 46 cancelled.

Response to Arguments

[2]   Applicant's arguments with respect to claims 1-3, 5-15, 17-21, 31-35, 38-45, and 47-5 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 101

[3]   In response to the Amendments to the Claims received on Jan. 28, 2009, the previous § 101 rejections are withdrawn.

Claim Rejections - 35 USC § 102

[4]   The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Frishman et al.

[5]   **Claims 1, 3, 13, 15, 31-32, 43,** and **45** are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Pub. No. 2003/0044080 (published Mar. 6, 2003, hereinafter "Frishman et al.").

Regarding **claim 1**, *Frishman et al.* discloses a method for processing images (fig. 1) compressed using block based compression ("compressed using one of the compression method mentioned above" at para.0012), comprising:

using a processor or computer to perform the steps of:

determining whether two blocks are neighboring blocks of pixels (the 8 x 8 blocks of pixels in fig. 2 must have been determined to be neighboring to continue the fig. 5 algorithm at item 300 to block boundary classify edge pixel items P_8 and P_9);

determining whether the two neighboring blocks are both subdivided (edge pixel items P_5 through P_{12} undergo Threshold_1 at fig. 5, items 152, 302; if there is exists a pixel pair such that their difference is greater than Threshold_1, the block is subdivided; e.g., if $|P_{10}-P_{11}|>$Threshold_1, then the block containing edge pixel items P_{10}, P_{11} is subdivided; e.g., fig. 6c, top-right block is subdivided) if it is determined that the two blocks are neighboring blocks (fig. 6c, top-left and top-right blocks); and

performing deblocking filtering (fig. 5, item 156) on one or more edge pixels (at most edge pixel items P_4 though P_{13} after item 154 at fig. 5) of the two neighboring blocks (fig. 6c, top-left and top-right blocks), after determining that at least one of the two neighboring blocks is not subdivided (fig. 6c, top-left block is determined to be not subdivided when P_5 through P_8 differences < Threshold_1);

using a first deblocking filter on one or more edge pixels of the two neighboring blocks if only one of the two neighboring blocks is subdivided (fig. 6c, top-left and top-right block is an

example of a first deblocking filter used on all pixels marked "X", the top-right block subdivided, the top-left block not subdivided); and

using a second deblocking filter on one or more edge pixels of the two neighboring blocks if neither of the two neighboring blocks is subdivided (though no example given in fig. 6, it is possible that all pixel item differences P_4 though P_{13} < Threshold_1 such that the top-right block of fig. 6c is symmetric with the top-left block of fig. 6c, both blocks not being subdivided, a second deblocking filter would be used different from the first deblocking filter).

Regarding **claim 3**, *Frishman et al.* discloses wherein determining whether two neighboring blocks are both subdivided comprises:

obtaining a block size assignment values (the block size assignment information is 8 x 8 already known by the algorithm); and

using the block size assignment value to determine whether the two neighboring values are subdivided (the algorithm "uses" the block size assignment value to determine whether the two neighboring values are subdivided).

Regarding **claim 13**, claim 1 recites identical features as in claim 13. Thus, references/arguments equivalent to those presented for claim 1 are equally applicable to claim 13. The means-plus-function language is anticipated by the computer needed to perform fig. 4.

Regarding **claim 15**, claim 3 recites identical features as in claim 15. Thus, references/arguments equivalent to those presented for claim 3 are equally applicable to claim 15. The means-plus-function language is anticipated by the computer needed to perform fig. 4.

Regarding **claim 31**, claim 1 recites identical features as in claim 31. Thus, references/arguments equivalent to those presented for claim 1 are equally applicable to claim 31.

Regarding **claim 32**, claim 3 recites identical features as in claim 32. Thus, references/arguments equivalent to those presented for claim 3 are equally applicable to claim 32.

Regarding **claim 43**, claim 1 recites identical features as in claim 43. Thus, references/arguments equivalent to those presented for claim 1 are equally applicable to claim 43.

Regarding **claim 45**, claim 3 recites identical features as in claim 45. Thus, references/arguments equivalent to those presented for claim 3 are equally applicable to claim 45.

Claim Rejections - 35 USC § 103

[6]   The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Frishman et al. in view of Thyagarajan et al.

[7]   **Claims 2, 14, 33,** and **44** are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Frishman et al.* in view of U.S. Patent No. 6,529,634 (issued Mar. 4, 2003, *hereinafter* "Thyagarajan et al.").

Regarding **claim 2,** *Frishman et al.* does not teach wherein determining whether two neighboring blocks are both subdivided comprises: obtaining variance values of each of the two neighboring blocks; comparing the variance values to a first threshold; and determining whether the two neighboring blocks are both subdivided based upon the comparison of the variance values to the first threshold.

Thyagarajan et al. teaches a contrast sensitive variance based adaptive block size DCT image compression that teaches wherein determining whether two neighboring blocks are both subdivided comprises:

obtaining variance values of each of the two neighboring blocks (*e.g.* blocks P_{32} and P_{33} of fig. 3b are neighboring);

comparing the variance values ("V4ij" in item 226 of fig. 2) to a first threshold ("T4" in item 226 of fig. 2); and

determining whether the two neighboring blocks are both subdivided based upon the comparison of the variance values to the first threshold (fig. 2, items 224, 226, 228, 230

determines that both blocks are both subdivided based upon the PQR data which was based upon the comparison of the variance values to the first threshold).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the apparatus of *Frishman et al.* to determines whether two neighboring blocks are divided <u>based upon variance values of each block</u> as taught by *Thyagarajan et al.* as "[v]ariance based block size assignment offers several advantages. Because the Discrete Cosine Transform is performed after block sizes are determined, efficient computation is achieved. The computationally intensive transform need only be performed on the selected blocks. In addition, the block selection process is efficient, as the variance of pixel values is mathematically simple to calculate. Still another advantage of variance based block size assignment is that it is perceptually based. Pixel variance is a measure of the activity in a block, and provides indication of the presence of edges, textures, etc. It tends to capture the details of a block much better than measures such as the average of pixel values. Thus, the variance based scheme of the present invention assigns smaller blocks to regions with more edges and larger blocks to the flatter regions. As a result, outstanding quality may be achieved in the reconstructed images.", *Thyagarajan et al.*, 9-25.

Regarding **claim 14**, claim 2 recites identical features as in claim 14. Thus, references/arguments equivalent to those presented for claim 2 are equally applicable to claim 14.

Regarding **claim 33**, claim 2 recites identical features as in claim 33. Thus, references/arguments equivalent to those presented for claim 2 are equally applicable to claim 33.

Regarding **claim 44**, claim 2 recites identical features as in claim 44. Thus, references/arguments equivalent to those presented for claim 2 are equally applicable to claim 44.

Frishman et al. in view of Lee et al.

[8]   **Claims 5** and **47** are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Frishman et al.* in view of U.S. Patent No. 6,539,060 (issued Mar. 25, 2003, *hereinafter* "Lee et al.").

Regarding **claim 5,** *Frishman et al.* does teach wherein using the second blocking filter comprises using a two point averaging filter on two edge pixels of the two neighboring blocks.

Lee et al. teaches using a blocking filter comprises using a two point averaging filter on two edge pixels of the two neighboring blocks (fig. 6c, items C", D").

It would have been obvious to one of ordinary skill in the art at the time the invention was made for the second blocking filter of *Frishman et al.* to include using a two point averaging filter on two edge pixels of the two neighboring blocks as taught by *Lee et al.* teaches "to provide an image data post-processing method for reducing quantization effects such as blocking artifacts, corner outliers and ringing noise, from an MPEG-decompressed image, which can perform low bit rate coding without complex computation, and an apparatus therefor." *Lee et al.* at 2:25-39.

Regarding **claim 47**, claim 5 recites identical features as in claim 47. Thus, references/arguments equivalent to those presented for claim 5 are equally applicable to claim 47.

Allowable Subject Matter

[9]   **Claims 34-35** and **38-42** allowed.

[10]   **Claims 6-12, 17-21,** and **48-54** objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

[11]   The following is a statement of reasons for the indication of allowable subject matter:

Regarding **claim 6** (and claims 17, 48 by analogy), while the prior art of record discloses the elements of claim 1, the prior art of record does not teach obtaining one or more difference values of one or more edge pixels of the two neighboring blocks, if neither of the two neighboring blocks is subdivided; comparing the one or more difference values to a second threshold; and selecting the second deblocking filter based on the comparison.

Regarding **claim 34**, while the prior art of record discloses the elements of claim 1, the prior art of record does not teach when two or more of the one or more difference values exceeds the threshold value, filtering the edge pixels using a Gaussian filter, wherein the Gaussian filter comprises an N-point Gaussian filter.

Conclusion

[12]   Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID P. RASHID whose telephone number is (571)270-1578 and fax number (571)270-2578. The examiner can normally be reached Monday - Friday 7:30 - 17:00 ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David P. Rashid/
Examiner, Art Unit 2624

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